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EXAMINER
HANNAHER, C

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This is a communication from the examiner in charge of your application.
COMMISSIONER OF PATENTS AND TRADEMARKS

☐ This application has been examined ☑ Responsive to communication filed on 11/03/1994 ☐ This action is made final.

A shortened statutory period for response to this action is set to expire Three (3) month(s), _____ days from the date of this letter.
Failure to respond within the period for response will cause the application to become abandoned. 35 U.S.C. 133

Part I THE FOLLOWING ATTACHMENT(S) ARE PART OF THIS ACTION:

1. ☑ Notice of References Cited by Examiner, PTO-892.
2. ☐ Notice of Draftsman's Patent Drawing Review, PTO-948.
3. ☑ Notice of Art Cited by Applicant, PTO-1449.
4. ☐ Notice of Informal Patent Application, PTO-152.
5. ☐ Information on How to Effect Drawing Changes, PTO-1474.
6. ☐ _____.

Part II SUMMARY OF ACTION

1. ☑ Claims 1-30 are pending in the application.
   Of the above, claims _____ are withdrawn from consideration.
2. ☐ Claims _____ have been cancelled.
3. ☐ Claims _____ are allowed.
4. ☑ Claims 1-30 are rejected.
5. ☐ Claims _____ are objected to.
6. ☐ Claims _____ are subject to restriction or election requirement.
7. ☐ This application has been filed with informal drawings under 37 C.F.R. 1.85 which are acceptable for examination purposes.
8. ☐ Formal drawings are required in response to this Office action.
9. ☐ The corrected or substitute drawings have been received on _____. Under 37 C.F.R. 1.84 these drawings are ☐ acceptable; ☐ not acceptable (see explanation or Notice of Draftsman's Patent Drawing Review, PTO-948).
10. ☐ The proposed additional or substitute sheet(s) of drawings, filed on _____. has (have) been ☐ approved by the examiner; ☐ disapproved by the examiner (see explanation).
11. ☐ The proposed drawing correction, filed _____, has been ☐ approved; ☐ disapproved (see explanation).
12. ☐ Acknowledgement is made of the claim for priority under 35 U.S.C. 119. The certified copy has ☐ been received ☐ not been received ☐ been filed in parent application, serial no. _____ ; filed on _____.
13. ☐ Since this application apppears to be in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under Ex parte Quayle, 1935 C.D. 11; 453 O.G. 213.
14. ☐ Other

EXAMINER'S ACTION

Part III DETAILED ACTION

Oath/Declaration

1. Applicant has not given a post office address anywhere in the application papers as required by 37 C.F.R. § 1.33(a). A statement over applicant's signature providing a complete post office address is required. The post office address should include the ZIP® Code designation. M.P.E.P. § 605.03.

Drawing(s)

2. The drawings are objected to under 37 C.F.R. § 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the "means for adjusting a separation distance" must be shown or the feature cancelled from the claim. No new matter should be entered.

Specification

3. The following is a quotation of the first paragraph of 35 U.S.C. § 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

The specification is objected to under 35 U.S.C. § 112, first paragraph, as failing to adequately teach how to make and/or use the invention, *i.e.*, failing to provide an enabling disclosure.

The specification does not identify corresponding structure, material, or acts (as appropriate) for the claimed expression "means for adjusting a separation distance". Accordingly, it cannot enable the full scope of the claim(s) containing this expression.

The specification does not identify corresponding structure, material, or acts (as appropriate) for the claimed expression "creating a visual overlay... displaying the image signal in conjunction...." Accordingly, it cannot enable the full scope of the claim(s) containing this expression.

Claim(s)—Rejection(s)/35 U.S.C. §112

4. Claims 3 and 18 are rejected under 35 U.S.C. § 112, first paragraph, for the reasons set forth in the objection to the specification.

The specification cannot be enabling for the full scope of the expressions "means for adjusting a separation distance" and "creating a visual overlay... displaying the image signal in conjunction...."

5. Claims 3 and 18 are rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The recitation in claim 3 at lines 2-3 of "means for adjusting a separation distance" is unclear, as the meaning of this phrase cannot be determined. The recitation in claim 18 at lines 4-8 of "creating a visual overlay... displaying the image signal in conjunction..." is unclear, as the meaning of this phrase cannot be determined.

6. A rejection based upon applied prior art can not be sustained if such rejection is based on assumptions concerning what is being claimed. See *In re Steele*, 305 F.2d 859, 134 USPQ 292 (CCPA 1962). Because the scope of claim 18 cannot be reliably ascertained, no further action on the merits will be made as to this claim.

Claim(s)—Rejection(s)/35 U.S.C. §103

7. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

8. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. § 103, the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 C.F.R. § 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of potential 35 U.S.C. § 102(f) or (g) prior art under 35 U.S.C. § 103.

9. Claims 1, 2, 4-9, 13, 15-17 and 19-21 are rejected under 35 U.S.C. § 103 as being unpatentable over Fenimore *et al.* (US 4,209,780) in view of Walker (US 5,308,986).

With respect to independent claim 1, Fenimore *et al.* discloses gamma ray imaging wherein the system comprises coded aperture **16**, position sensitive detector **14**, signal processor **22** and display **28**. Although Fenimore *et al.* describes the position sensitive detector as "*e.g.*, an Anger camera" those of ordinary skill in the art recognize that alternative position sensitive detectors are known for the purpose of imaging gamma rays. Walker is an example of gamma ray imaging (column 9, line 47) wherein the system comprises a position sensitive detector **22**, an array of charge coupled devices **26**, and a signal processor (column 8, line 62). In view of the improved resolution for radiographic imaging described by Walker, it would have been obvious to one of ordinary skill in the art to replace the position sensitive detector **14** of Fenimore *et al.* with an array of charge coupled devices as shown by Walker.

With respect to dependent claim 2, Fenimore *et al.* discloses display **28**.

With respect to dependent claims 4-6, Walker discloses fiber optic taper **28** and image guide **30**. In view of the improved optical coupling achieved thereby, it would have been obvious to one of ordinary skill in the art to include such an element in the system of Fenimore *et al.*

With respect to dependent claims 7-8, Walker discloses image intensifier **24**. In view of the improved optical amplification achieved thereby, it would have been obvious to one of ordinary skill in the art to include such an element in the system of Fenimore *et al.* The type of image intensifier is a choice within the ordinary skill in the art.

With respect to dependent claim 9, the coded aperture **16** of Fenimore *et al.* is uniformly redundant (column 4, line 34).

With respect to dependent claim 13, Walker discloses a plastic fiber scintillator **22** as the position sensitive detector.

With respect to independent claim 15-16, the choices of cross-sectional area and field of view are within the ordinary skill in the art in view of the intended application and the like.

With respect to independent claim 17, Fenimore *et al.* discloses gamma ray imaging wherein the method would comprise the provision of a gamma ray imaging device (Fig. 2) including coded aperture **16**, position sensitive detector **14**, signal processor **22** and display **28**, situating the device in the filed of view of source **10** and displaying the image of the source at display **28**. Although Fenimore *et al.* describes the position sensitive detector as "*e.g.*, an Anger camera" those of ordinary skill in the art recognize that alternative position sensitive detectors are known for the purpose of imaging gamma rays. Walker is

an example of gamma ray imaging (column 9, line 47) wherein the system comprises a position sensitive detector **22**, an array of charge coupled devices **26**, and a signal processor (column 8, line 62). In view of the improved resolution for radiographic imaging described by Walker, it would have been obvious to one of ordinary skill in the art to replace the position sensitive detector **14** of Fenimore *et al.* with an array of charge coupled devices as shown by Walker.

With respect to independent claim 19, the use of the gamma ray imaging system suggested by Fenimore *et al.* and Walker with x-rays would have been obvious to one of ordinary skill in the art in view of the similar energies involved.

With respect to dependent claims 20-21, Walker discloses fiber optic taper **28**. In view of the improved optical coupling achieved thereby, it would have been obvious to one of ordinary skill in the art to include such an element in the system of Fenimore *et al.*

10. Claim 3 is rejected under 35 U.S.C. § 103 as being unpatentable over Fenimore *et al.* (US 4,209,780) and Walker (US 5,308,986) as applied to claim 2 above, and further in view of Gourlay (US 4,435,838).

With respect to dependent claim 3, Gourlay teaches the variation of the distance of the coded aperture mask **11** and the position sensitive detector **10**. In view of the ability to image objects **14** of different sizes, it would have been obvious to one of ordinary skill in the art to include the ability to vary the distance between the coded aperture **16** and position sensitive detector **14** of Fenimore *et al.*

11. Claims 10-12 and 22 are rejected under 35 U.S.C. § 103 as being unpatentable over Fenimore *et al.* (US 4,209,780) and Walker (US 5,308,986) as applied to claim 1 above, and further in view of Buchanan *et al.* (US 5,122,671).

With respect to dependent claims 10-12 and 22, although Walker discloses a plastic scintillator, those of ordinary skill in the art recognize that glass scintillators are also useful in radiographic applications. Buchanan *et al.* describes some reasons therefor in column 2. In view of the effectiveness of glass scintillators as described by Buchanan *et al.*, it would have been obvious to one of ordinary skill in the art to replace the plastic scintillator of Walker with a glass scintillator. The utility of a plurality of fibers and an external mural absorber as shown by Walker to improve resolution, however, would have led one of ordinary skill in the art to retain these elements.

12. Claim 14 is rejected under 35 U.S.C. § 103 as being unpatentable over Fenimore *et al.* (US 4,209,780) in view of Walter (FR 2626679).

With respect to independent claim 14, Fenimore *et al.* discloses gamma ray imaging wherein the system comprises coded aperture **16**, position sensitive detector **14**, signal processor **22** and display **28**. Although Fenimore *et al.* describes the position sensitive detector as "*e.g.*, an Anger camera" those of ordinary skill in the art recognize that alternative position sensitive detectors are known for the purpose of imaging gamma rays. Walter is an example of gamma ray imaging wherein the system comprises a single crystal scintillator and an array of charge coupled devices. In view of the improved resolution for radiographic imaging described by Walter, it would have been obvious to one of ordinary

skill in the art to replace the position sensitive detector **14** of Fenimore *et al.* with a crystal scintillator and an array of charge coupled devices as shown by Walter.

13. Claim 23 is rejected under 35 U.S.C. § 103 as being unpatentable over Dean (1984).

With respect to independent claim 23, Dean discloses a gamma ray imaging system (note the title) which comprises a coded mask (rotating modulator) and a position sensitive detector with semiconductor detectors (germanium planar array), but not a signal processor. Nevertheless, the use of a signal processor is implied to one of ordinary skill in the art in view of the ability to deliver an image as shown in Fig. **6**. Therefore, it would have been obvious to one of ordinary skill in the art that the gamma ray imaging system of Dean includes a signal processor.

14. Claims 28-30 are rejected under 35 U.S.C. § 103 as being unpatentable over Dean (1984) as applied to claim 23 above, and further in view of Buchanan *et al.* (US 5,122,671) and Tri Tran *et al.* (EP 0441521).

With respect to dependent claim 28, although the gamma ray imaging system of Dean does not appear to include a scintillator, those of ordinary skill in the art recognize that radiographic imaging using an array of semiconductor gamma ray detectors comprising a scintillator is routine, as shown by Tri Tran *et al.* Tri Tran *et al.* discloses an x-ray detection device **12** which comprises a position sensitive detector including an array **30** of semiconductor gamma ray detectors comprising a scintillator **28**. In view of the utility of using a scintillator in detecting gamma rays with an array of semiconductor gamma ray detectors, it would have been obvious to one of ordinary skill in the art to provide the gamma ray imaging system of Dean with a scintillator. Those of ordinary skill in the art

recognize that glass scintillators are useful in radiographic applications. Buchanan *et al.* describes some reasons therefor in column 2. In view of the effectiveness of glass scintillators as described by Buchanan *et al.*, it would have been obvious to one of ordinary skill in the art to replace the scintillator suggested by Tri Tran *et al.* with a glass scintillator.

With respect to dependent claim 29, Tri Tran *et al.* describes the utility of a plurality of fibers.

With respect to dependent claim 30, the utility of an external mural absorber to improve resolution is known to those of ordinary skill in the art and it would have been obvious to one of ordinary skill in the art to include such an absorber in the plurality of columns in the scintillator suggested by Tri Tran *et al.*

15. Claims 24 and 25 are rejected under 35 U.S.C. § 103 as being unpatentable over Tri Tran *et al.* (EP 0441521) in view of Dean (1984).

With respect to independent claim 24, Tri Tran *et al.* discloses an x-ray detection device **12** which comprises a position sensitive detector **28**, an array **30** of semiconductor photodiodes, and a signal processor **34**. Although Tri Tran *et al.* does not discloses a coded mask, those of ordinary skill in the art recognize that a combination therewith is a typical use for an x-ray detection device as shown by Tri Tran *et al.* Dean discloses a gamma ray imaging system which comprises a coded mask and germanium planar array. In view of the ability of the x-ray detection device of Tri Tran *et al.* to detect the incident photons passed by the coded mask of Dean, it would have been obvious to one of ordinary skill in

the art to provide such a coded mask as shown by Dean in the x-ray imaging system of Tri Tran *et al.*

With respect to dependent claim 25, a display is shown by Tri Tran *et al.* at **22**.

16. Claims 26 and 27 are rejected under 35 U.S.C. § 103 as being unpatentable over Tri Tran *et al.* (EP 0441521) in view of Dean (1984) as applied to claim 24 above, and further in view of Walker (US 5,308,986).

With respect to dependent claims 26 and 27, Walker discloses fiber optic taper **28**. In view of the improved optical coupling achieved thereby, it would have been obvious to one of ordinary skill in the art to include such an element in the system suggested by Tri Tran *et al.* in view of Dean.

17. Claims 24-26 are rejected under 35 U.S.C. § 103 as being unpatentable over Garcia *et al.* (1986).

With respect to independent claim 24 and dependent claim 25, Garcia *et al.* discloses a coded mask (URA), position sensitive detector (NaI(Tl) scintillation crystal), and image intensifier tubes, one of which includes a silicon PIN diode readout (page 736). The use of signal processor and display is implied in the creation of the images shown in Fig. 7.

With respect to dependent claim 26, Garcia *et al.* discloses fiber optic plug **FO** (see Fig. **2**) as means to transfer the coded optical signal to the semiconductor photodiode array.

Response to Submission(s)

18. Applicant's arguments with respect to claims 1-30 have been considered but are deemed to be moot in view of the new grounds of rejection.

Conclusion

19. Papers related to Group 2500 applications **only** may be submitted to Group 2500 by facsimile transmission. Any transmission not to be considered an official response must be clearly marked "DRAFT". The faxing of such papers must conform with the notice published in the Official Gazette, 1096 OG 34-35 (November 15, 1988). The Group 2500 Fax Center number is (703) 305-3594 or 308-1753.

20. *Any inquiry concerning this communication or earlier communications from the examiner should be directed to Examiner Hannaher whose telephone number is (703) 308-4850.*

Any inquiry of a general nature or relating to the status of this application should be directed to the Group 2500 receptionist whose telephone number is (703) 308-0956.

ch-12/13/1994

CONSTANTINE HANNAHER
PRIMARY EXAMINER
GROUP ART UNIT 2506